

Environmental Studies Program FY 1998 Annual Report

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Introduction

As stewards of our Federal offshore lands known as the Outer Continental Shelf (OCS), the Department of the Interior's Minerals Management Service

(MMS) is responsible for balancing the Nation's search for petroleum energy and marine minerals with the protection of the human, marine, and coastal environments. The MMS's environmental programs serve this important mission by providing the solid scientific underpinnings for the critical program decisions that must, by law, accommodate this delicate balance. The MMS commitment to environmental protection begins with the first steps in the leasing process and continues through to the end of the production activity with decommissioning of the production structure.

This Program Summary highlights some of the most important activities and accomplishments of the Environmental Studies Program (ESP) during Fiscal Year (FY) 1998. The report presents technical program information organized by OCS Region, followed by a programwide financial summary.

Planning and Direction

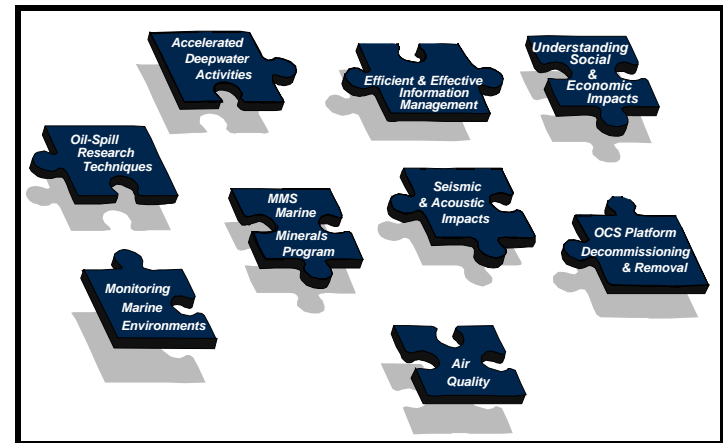
FY 1998 saw the publication of ESP's *National Strategic Plan for 1998-2002*.

The plan was

developed to identify and discuss general OCS programmatic trends and directions over the next 2-4 years and to serve as a basis for identifying important research themes that will

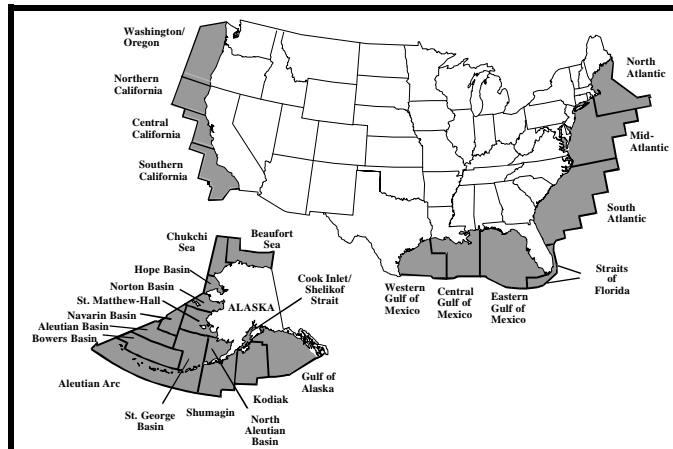
dominate the program.

The full text of the plan can be found on the Internet at: www.mms.gov/eppd/reports.



ESP National Strategic Plan, 1998-2002

During FY 1998, the ESP funded almost 100 projects, described in the Annual Studies Plans prepared by each of the Regions, which are based on the themes outlined in the National Strategic Plan. This research supports diverse information needs in many of the OCS Planning Areas—ranging from the Destin Dome area of the Northeastern Gulf of Mexico (GOM) and the GOM deepwater areas to prospects for development in the shallow nearshore areas of the Beaufort Sea in Alaska. It also identifies information needs ranging from information for sand and gravel decisions along the Atlantic coast to environmental monitoring efforts to support offshore production in southern California.



OCS Planning Areas

Program Highlights

Gulf of Mexico Region

Ice Worms Discovered! In 1984, MMS-funded researchers discovered the existence of unique ecosystems associated with petroleum seeps on the upper continental slope in the northern GOM. The MMS is now studying the stability and change in these *chemosynthetic communities*, and a second year of field sampling was completed during FY 1998. A major biological discovery was made through this project with the observation and collection of a new species of polychaete, now

popularly called the “ice worm.” This new species was found inhabiting burrows in crystallized gas hydrates on the seafloor at water depths of approximately 700 meters. With today’s petroleum interests moving into deeper waters, information from this study has been used to determine mitigation needed to protect such very specialized communities of bottom dwelling organisms.

Results of the research conducted to date indicate that,



Ice Worms on Methane Hydrate Outcrop

although the chemosynthetic communities are susceptible to mechanical damage by offshore drilling and production activities, they are prevalent enough that such localized disturbances should not affect their overall viability.

Flower Gardens Monitoring Indicates Healthy Coral Reefs! During FY 1998, MMS continued a

cooperative study effort with the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Sanctuary Program to monitor the environmental conditions and the health of the coral reefs at the Flower Garden Banks National Marine Sanctuary, which is located approximately 120 miles off the Texas coast. A draft report for 1996 and 1997 monitoring was also completed.

The MMS has studied the Flower Garden Banks since 1974, and they began a program to monitor the general health of the Banks in 1988. Research, to date, shows that the corals of the



Photodocumenting Flower Gardens' Health

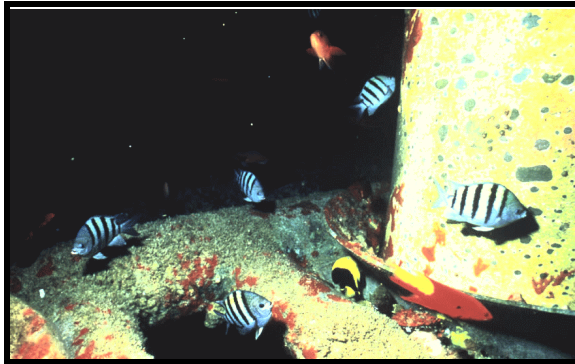
East and West Flower Garden Banks are healthy and growing. Results of the current monitoring effort will be used in further evaluations of the effectiveness of lease stipulations designed to protect these biological resources.

Hard-Bottom Biological Communities Being

Studied. In the northeastern GOM, the second year of field sampling was completed in a multidisciplinary study designed to describe and monitor biological communities and environmental conditions on three types of hard-bottom features, including high relief (10-15 m) pinnacles on the Mississippi-Alabama OCS. Preliminary results showed that little of the biological variation among the study sites was due to physical variables such as water depth, vertical relief, distance from the Mississippi River, or suspended sediment flux. Also, little or no evidence of petroleum-related hydrocarbons had been observed at any of the nine study sites. Final results of this study, to be completed in late 2000, will be used to determine the sensitivity of these bottom features, especially as fisheries resources, to offshore natural oil and gas development activities, and to ensure the development of appropriate protection measures.

Fish Mortality From Explosive Platform Removal Negligible.

In 1995, MMS began a study to quantify the potential impacts on fish resources from the use of explosives during offshore petroleum platform removal activities. Specific research objectives are: (a) to determine abundance of fish and mortality associated with platforms, their removal, and other contributing factors, (b) to estimate the total abundance of the population at risk and the effects on its productivity, and (c) to compare these data to other sources of anthropogenic-based



Fish Surrounding Platform Legs

mortality. The 1998 draft results indicate that fish mortality caused by the use of explosives to remove platform legs is negligible, especially in light of other anthropogenic activities and their impacts on populations and abundance. Additional studies and data analysis will continue during FY 1999.

Louisiana State University Coastal Marine

Institute Studies Platform Ecology. The MMS established a cooperative research partnership with Louisiana State University in 1992, known as the Coastal Marine Institute (CMI), through which cost-shared, mission-oriented research is conducted. Through the CMI, MMS entered into an exciting partnership this year with academia and the offshore oil and gas industry to gain a deeper insight into migratory birds moving across the Gulf of Mexico and their interactions with offshore production platforms along the way.

These North American migratory birds constitute an extremely

important integral part of the ecosystem. They consume insects, distribute seeds, and serve as a food source for higher level predators. The present study will combine a variety of researchers and logistical arrangements in a unique opportunity to observe these trans-Gulf migrations and the islands of refuge that platforms may provide along the way.

Although it is far too early to draw definite conclusions, one general impression is that, although the birds migrating through the study area number in the hundreds of thousands, only a few



**Example of Neotropical
Migratory Bird**

thousand landed on platforms, mainly during bad weather. Most of these rested and then continued their journey. It is generally believed that the small percentage that did die almost certainly would have fallen exhausted into the Gulf. Thus, it seems likely that offshore

platforms benefit migrating birds to some extent by offering them an opportunity to rest.

Other studies awarded in 1998 through the CMI program are investigating the use of platforms by fish populations. The key issues focus on understanding how fish populations are using

the platforms as habitats and what the possible impacts on fish populations will be when a platform is removed. One component of this research will further evaluate the depth at which a platform no longer contributes an artificial reef effect to the ecosystem.

GULFCET II Field Work Completed! GULFCET is one of the few marine mammal programs that has attempted to identify patterns and environmental factors that affect population distribution and behavior. The study also attempts to determine the species present and the abundance of marine mammals in GOM deepwater areas. MMS began this long-term study in the central and western planning areas of the northern Gulf of Mexico in 1991. In 1996, the study area was expanded with GULFCET II to include the eastern GOM. Field work for GULFCET II was completed in the late spring of 1998.

Preliminary analysis of the GULFCET II data supports and

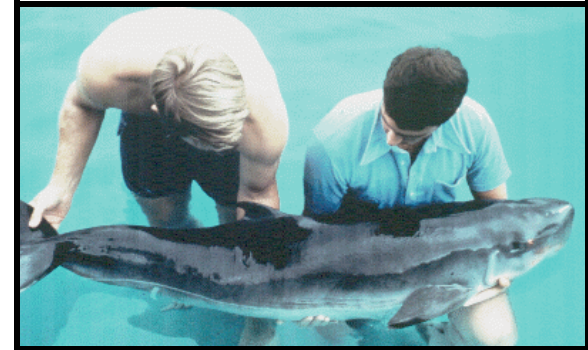
Pygmy sperm whale	Killer whale
Dwarf sperm whale	Short-finned pilot whale
Cuvier's beaked whale	Rough-toothed dolphin
Blainville's beaked whale	Fraser's dolphin
Gervais' beaked whale	Risso's dolphin
Melon-headed whale	Striped dolphin
Pygmy killer whale	Spinner dolphin
False killer whale	Clymene dolphin

Species Known to Have Deepwater Populations

extends the area of the Gulf in which diverse populations of

cetaceans are found; it sheds light on the abundance and distribution of more common cetaceans as well as others less frequently seen; and it provides information on how these animals interact with their deepwater environment.

Distribution of most species, including sperm whales, appears to be associated with rings of cold water where productivity is high. These surveys have revealed that the sperm whale is the

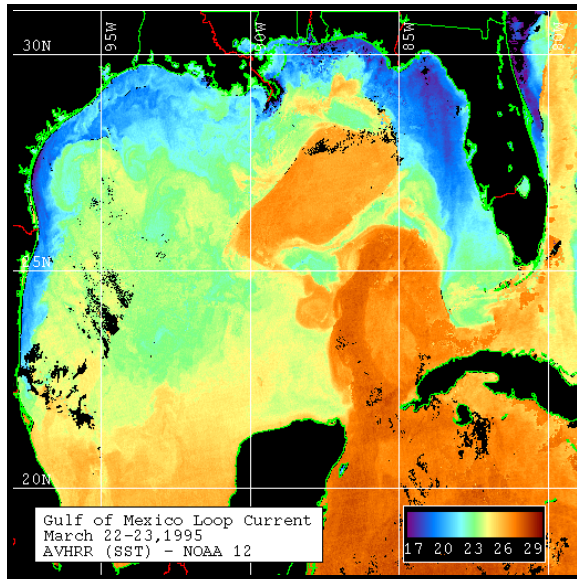


Dwarf Sperm Whale

only large whale with a resident population in the Gulf of Mexico, and Bryde's whale is the only baleen whale seen consistently in the GOM. Before these surveys, the regular presence of these two cetaceans had not been suspected.

LATEX Physical Oceanography Program Wraps Up! The multiyear Louisiana/Texas (LATEX) physical oceanographic study has wrapped up, and its final reports and publications became available in 1998. To support MMS prelease and postlease activities, the effects of wind and rivers

on coastal circulation jets, the exchange of shelf flows, the intrusions of the Loop Current and eddies onto the slope, and the seasonal variations of shelf circulation were all documented in these publications. The requests for publications and data



Satellite Image Showing LOOP Current

patterns of winds and currents for the region.

In addition, a draft final report of the Coastal Ocean Modeling study was submitted this year. The objective of this study was to provide MMS with an improved capability to estimate oil-spill trajectories on the Gulf of Mexico OCS. The modeling study used many LATEX program observations to validate the computational results. The model's ability to simulate the

sharing with LATEX have increased greatly in 1998. Other Federal agencies, State governments, industries, and academic institutions have formed partnerships that will use this information to develop systems to forecast local

GOM Loop Current and its eddies improved dramatically over the course of the study. A statistical comparison showed that the nearsurface currents determined by the model were consistent with those observed by drifting buoys, thus increasing the model's validity. The numerical results of this modeling study are presently undergoing conversion into the Oil-Spill Risk Analysis (OSRA) model, which is used by MMS to estimate oil-spill trajectories and the combined probabilities of oil-spill occurrence and contact with environmental resources.

Northeast GOM Physical Oceanography Field and Modeling Efforts Continue. In the northeast GOM, several parallel studies are being conducted to study physical processes in the region. These studies investigate (a) the effects of the Loop Current and eddy intrusions on shelf water flows, wind-driven coastal currents, and west Florida shelf currents; and (b) the effects of wind and rivers on the flows across the inner and mid-shelf. The information from these studies will also be used in the OSRA model.

Among these studies, the DeSoto Canyon Study completed a second year of field observations, with high data recovery from the moored instruments and from the cruise hydrography. The time series of data even went through two hurricanes, Earl and Georges. In 1998, the Chemical Oceanography and Hydrography Study completed three planned cruises. Six more cruises are planned over the next 2 years. The Remote Sensing Study provides satellite images of the Loop Current and eddies in the region.

Socioeconomic Research Gets Increased Emphasis!

In response to the deepwater-driven growth in the offshore oil and gas industry and as a result of the 1997 workshop on issues surrounding deepwater oil and gas development, MMS has initiated several studies to address the socioeconomic implications of deepwater development.

A new study for 1998, titled *Assessing and Monitoring Industry Labor Needs*, addresses the direct effects of deepwater development on State and regional economies. Since these effects are driven by industry employment and purchasing, MMS is able to make more detailed and accurate projections and economic forecasts, and to address issues concerning State and local benefits of deepwater development and/or exploration.

Focusing on gas resources, 1998 has seen the completion of the draft final report, titled *History of Coastal Alabama Natural Gas Exploration and Development*. This economic modeling study defines the role that natural gas production has had on the Alabama economy, with consideration given to past and forecast production. This research shows that the cost functions in Alabama are quite different from other coastal States in the GOM Region. This analysis was accomplished by grouping the expenditures into categories based on location: deep water, medium water, and shallow water. The study suggests a more localistic approach when modeling economic impacts from OCS activity. Economists throughout MMS are now using this study's findings.

Community Level Impacts Studied! At the community

level, research in 1998 focused on the effects of OCS activities on inventory of roads, water, waste disposal, public education, and available medical and health facilities for supporting oil and gas development, particularly in deepwater. *Benefits and Burdens of OCS Activities on Selected Communities and Local Public Institutions* is a study attempting to deal with these effects, while *An Analysis of the Socioeconomic Effects of OCS-Activities on Ports and Surrounding Areas in the Gulf of Mexico Region* is identifying available port facilities that directly or indirectly support oil and gas production. Both of these studies are in

the initial stages of data collection.

Through research, the ESP has found that infrastructure may be one of the more significant social issues related to oil and gas activity in the GOM Region. The conditions of roads and sewage facilities are heavily impacted with in-migration and enhanced usage.



**Eroded Shoulder of State Route 1
Near Port Fourchon**

The study, *A Socioeconomic Analysis of Port Expansion at*

Port Fourchon, which is nearing completion, examines infrastructure as it is related to the recent upswing in offshore exploration and development. Port Fourchon, Louisiana, has experienced a rapid growth in OCS-related activities and has recently handled as much tonnage as the port facilities in New Orleans. While this upswing has brought needed jobs to the area, it has also stressed the existing infrastructure, particularly State Route 1, Port Fourchon's only highway connection.

Pacific Region

Ecology Studies Focus on Platform Removal Issues.

Future decisions regarding the decommissioning and removal of oil and gas platforms in the Santa Barbara Channel and the Santa Maria Basin will require an understanding of the relationship of platform-associated communities to the general ecology of the southern California continental shelf and to commercial and recreational fishes in the vicinity of the platforms. To collect this information, a 3-year study was initiated in 1998 addressing invertebrate and algal communities living on oil and gas platforms offshore southern California.

Also, a related study on the ecological role of natural reefs and oil and gas production platforms for rocky reef fishes in southern California completed a third year of field sampling. Results of this project showed that there were considerable differences in the fish communities of natural reefs and those around platforms. These differences appeared to be based largely on habitat depth, habitat type, physical oceanographic characteristics, and fishing pressures. Fish communities associated with some platforms were richer, as measured by

species diversity and biomass, than those of many natural reefs.

Intertidal Monitoring Grows to a Multiagency

Network! An in-house effort investigating the rocky intertidal communities of the California coast continued with a fifth year of field sampling during 1998. The MMS Intertidal Team (MINT) conducted surveys at several previously established sites and continued monitoring the recovery of experimentally cleared rocky intertidal communities.



MINT Team in the Field

Continued observations by the MINT demonstrated that experimentally cleared rocky intertidal mussel plots that were largely unrecovered in 1991 had since recovered to mussel beds.

The MMS also took the lead in developing a database for the Multi-Agency Rocky Intertidal Network (MARINE), which will include field measurements and supporting data contributed by intertidal scientists from several Federal and local agencies. The network, composed of 61 sites from San Luis Obispo to San Diego, is sponsored by 13 organizations.

Minerals Management Service	National Park Service
Department of Energy	U.S. Geological Survey
NOAA	U.S. Navy
Santa Barbara County	California Coastal Commission
Pacific Gas & Electric	California Dept. of Fish & Game
A.W. Mellon Foundation	Southern California Coastal Water
Tatman Foundation	Research Project

MARINE Participants

Physical Oceanography Studies Expand! The Scripps Institution of Oceanography continued the field observations in and modeling simulations of the Santa Barbara Channel/Santa Maria Basin. Most of the moored current meters were deployed in the Santa Maria Basin. This past year brought a major *El Niño* event and subsequent relaxation of the *El Niño* conditions. The field observations will continue for most of the next calendar year to develop information about the long-term variability of ocean flows.

In addition, the University of California at Santa Barbara CMI is working to install three Coastal Ocean Radar Systems in the Santa Barbara Channel, Pt. Conception, and Santa Maria Basin area to study the ocean flow connecting these two basins and the influence of offshore flows on the system. Two radar systems have been installed and began operating in 1998. The one in the Santa Maria Basin was delayed pending permission to install at the Vandenberg Air Force Base. The preliminary results from the first two systems show rapid changes of flow in the area; these data are currently undergoing further analysis.

Developing An Historical Perspective of Petroleum Industry. The study *Petroleum Extraction in Santa Barbara County: An Industrial History* is investigating the decline in the volume of oil produced in Santa Barbara County. Although oil activity has been a steady part of the local economies from 1950 to the present (and is likewise projected through 2015), the final 1998 draft report of this study maintains that the region would have been equally as well off economically had there been no such activity. The preliminary findings suggest that there has been no statistically significant pattern of positive impacts of the oil and gas industry's presence on the overall scale of economic activity.

COOGER Drawing To A Close. The study referred to as COOGER, *California Offshore Oil and Gas Energy Resources: A Joint Study of the Development Scenarios and Onshore Constraints in the Tri-County Area of San Luis Obispo, Santa Barbara, and Ventura*, began in 1995 and is

scheduled for completion in 1999. Its emphasis is on providing a comprehensive answer to the development potential of the existing undeveloped leases and the constraints on developing those leases off the coast of the Tri-County area.

The information document provides various socioeconomic scenarios over a 20-year period (1995-2015) for the Tri-County area. In addition to estimating the possible effects of development, the study has resulted in a common base of information for the areas being studied, which will allow a broader analysis of future development proposals.



**Platform Henry—
Santa Barbara Channel**

Perceptions of Risk. Attitudes towards oil and gas development in the Pacific Region seem to include NIMBY (Not in My Backyard) responses that have been conventionally characterized by limited information, localized attitudes, high concern for project risk, distrust of project sponsors and highly emotional responses to conflict. However, the study entitled

How Political Activists See Offshore Oil Development: An In-Depth Investigation of Attitudes on Energy Development, which was completed in 1998 under the Southern California University Initiative, maintains that these characterizations are only partially true. That is, neither the opponent nor the supporter is misinformed, both have localized attitudes, neither trusts the other, and neither is extremely emotional. The real difference lies in the perception of risk. Where opponents to development see huge risks, supporters perceive little risk. Therefore, the NIMBY label may tell us little other than that a political dispute exists and that the key element of the dispute is about the risks associated with the proposal.

Alaska Region

Information Updated on Arctic Kelp Communities.

The MMS convened a workshop on arctic kelp during FY 1998. This workshop provided a review and synthesis of available scientific information on the arctic kelp communities in Stefansson Sound and Camden Bay. It also served to help develop guidelines for future assessments of the effects of industry operations on kelp. The arctic kelps are generally associated with areas known as boulder patches. These boulder patches support unusual, diverse bottom communities. The workshop identified gaps in the data concerning quantitative information on these communities, which, if filled, would improve MMS's capabilities for environmental review of exploration and development plans.

Ringed Seal Survey Techniques To Be Evaluated.

A protocol that uses aerial surveys for monitoring ringed seal distribution and relative densities in arctic waters has already been developed for MMS. This protocol has been implemented



Ringed Seal Pup

over six field seasons during spring basking periods when the greatest number of seals are hauled out on the ice.

A recently awarded study uses unique methods to enhance the estimating protocol. By using specially trained dogs to locate ringed

seal lairs and radio tagging the seals, it will be possible to verify data from past and future ringed seal surveys. This correction will facilitate reanalysis of historical data collected in GIS compatible formats.

Arctic Bowhead Feeding Study Underway. MMS has initiated an intriguing effort designed to combine science and traditional knowledge of bowhead whale feeding activities in the eastern Alaskan Beaufort Sea from Kaktovik to the Canadian border.

Significant advancements were made in 1998 in developing a

project plan built on the consensus of numerous interested parties. The plan lays out the needs for and approaches of the fieldwork that will augment traditional knowledge to determine the importance of this area for bowhead feeding and to describe bowhead behavioral activity.



Bowhead Whale

Multiple Physical Oceanography Efforts

Underway. This year, efforts continued on a study that is developing and improving the model of sea-ice formation and ocean circulation. The results of this study will detail the field of ice motion and ocean currents that will be used in OSRA model estimates. The study will deliver multiyear simulation results next year.

The Alaska CMI at the University of Alaska-Fairbanks completed a study of the hindcast wind information available for the Beaufort/Chukchi Sea area, and a two-dimensional model of ice motion. This information will be useful in assessing oil-spill

contingency plans. The Alaska CMI also completed oceanographic field observations in the Chukchi Sea, concluding with a cruise report and the publication *Modeling the Circulation of the Chukchi Sea Shelf*.

A technical review of the MMS Oil Weathering Model was completed in 1998. This review concluded that several significant improvements could be made in the model algorithms. This model is used in environmental analyses, which evaluate the toxicity of spilled oil after various stages of weathering. Additional studies are being developed to address these improvements, which will be of value to the regions using the model.

Subsistence Cultures and Traditional Knowledge

Studied. Sociocultural research in Alaska continues to focus on subsistence cultures that depend largely on traditional practices and knowledge to survive. A study dealing with these issues, *Subsistence Economics and North Slope Oil Development*, which began in 1997 and will be completed in 1999, is in the final stages of analyzing quantitative data sets on subsistence harvest production, harvest distribution, and household employment in Kaktovik and Nuiqsut. Findings of the statistical analysis have been augmented by and interpreted using additional qualitative information collected through key respondent interviews of hunters in Kaktovik and Nuiqsut. The final stages of the study will include comparisons of subsistence harvest data from other villages that rely on caribou and marine resources.



Native Alaskans in Fishing Boat

Collection of Traditional Knowledge of the Alaskan North Slope, which began in 1997, has collected and organized "traditional knowledge" information associated with the North Slope of Alaska. It encompasses oral history, taped interviews, written transcripts, published sources, and textual and video records. The final identification of key traditional-knowledge indices will be completed early in 1999, followed by completion of the final report.

Headquarters

Coordination with USGS Biological Resources

Division Grows. The MMS works closely with the U.S. Geological Survey (USGS) Biological Resources Division (BRD) to establish annual priorities for biological research to be

conducted by BRD for MMS. This includes participation in the annual BRD Bureau Information Needs or BIN process. In FY 1998, MMS prepared a draft Interservice Agreement to establish the mechanisms for coordination and interaction between BRD and MMS in support of MMS biological science information requirements. The Agreement is intended to replace the Memorandum of Understanding of 1995 that established the framework for coordination between MMS and the National Biological Service.

At the project level, the long-term effort to maintain the biological specimens collected by MMS-sponsored studies was continued in FY 1998 with funding from BRD. The Smithsonian Institution incorporates the MMS samples into the collections of the U.S. National Museum of Natural History, Museum of Invertebrate Zoology. This provides reliable archiving and curating of the collections and makes them available to other researchers. Currently, the museum houses more than 160,000 sample lots for MMS. Of these, more than 68,000 sample lots are on loan to scientists at institutions around the world.

Sand and Gravel Research. The MMS has been actively studying several areas offshore Alabama, New Jersey, Maryland, Delaware, and North Carolina where OCS sand may be used in the future to renourish nearby beaches. Through existing cooperative agreements, the MMS, along with the Geological Surveys of each respective State, conducted studies to identify and characterize potential sites of high-quality clean sand deposits in Federal waters. These studies assessed the baseline benthic ecological conditions in and around the

proposed sand borrow areas offshore these States.



MMS-State Sand Resource/Environmental Study Areas

They also evaluated the resident benthic infauna and assessed the potential effects of offshore dredging activity on these organisms, including an analysis of the potential rate and success of recolonization following cessation of dredging activities. The information has been used (a) to develop schedules of the best and worst times for offshore dredging with respect to transitory, pelagic species; (b) to evaluate the potential modifications to waves that cross within the study area due to offshore dredging; and (c) to evaluate the impacts of offshore dredging and consequent beach renourishment in terms of the potential alteration in sediment transport patterns, sedimentary environments, and impacts to local shoreline processes. MMS will use information from these studies during the preparation of environmental assessments and impact

statements to assess offshore dredging operations before issuing any leases for the removal of Federal sand.

National Workshop Planned For Socioeconomic

Issues. MMS uses social science data and analysis in all phases of agency decisionmaking, from 5-year planning; through prelease and leasing activities, exploration, development and production; to the decommissioning of offshore platforms. MMS designs studies to address the analytical and data needs arising from specific phases of decisionmaking. In order to provide the best information possible for the decisionmaking process, planning began in 1998 for a national *socioeconomic workshop* to identify various research linkages among regions and studies and to explore long-term and methodological similarities and differences. This workshop will provide the planning and technical expertise needed for a state-of-the-art review of social and economic studies assessment as it relates to OCS oil and gas activities. This review will be published in report form and will be available to MMS for planning studies and developing long-term planning strategies. The workshop will complement MMS's existing national- and regional-level decisionmaking processes by setting boundaries on research needs and outlining a logical sequence of studies for future MMS needs.

Oceanographic Drifter Deployments Ending! In November 1998, MMS completed the last large-scale deployment of ocean drifters in a 7-year-long data collection effort. Over 800 satellite-tracked ocean current drifters were deployed in U.S. Gulf of Mexico coastal waters to determine the surface currents with spatial scales of tens to hundreds of

kilometers. These observations have been used to verify surface currents derived from a computer model of the GOM, which in turn have been used in the OSRA model. In addition, a few hundred of the oil-spill-simulating drifters have been deployed in the northeastern GOM for the purpose of skill assessing the OSRA model. This investigation should be completed within 2 years and will lead to improved oil-spill trajectory modeling.



Drifters Ready for Deployment

Coordination with Technology, Assessment, and Research Program

Grows. The use of explosives to remove decommissioned offshore structures is a

controversial topic in terms of safety for the professionals using this method of removal and the potential environmental impacts. In an effort to address these concerns and to investigate other ways to remove platforms, the Technology Assessment and Research Program, the Environmental Studies Branch, and industry worked together to determine the effectiveness of other types of explosives and the potential physical impacts from the pressure waves produced by explosives on nearby marine mammals and sea turtles. Experts in the use of explosives, turtle physiology and ecology, and marine mammal

physiology gathered with MMS scientists to explore a variety of approaches to refine information needs and define possible field data collection approaches. With discussions continuing through the end of 1998, the possibility of a jointly funded study in 1999 is high.

In addition, the Environmental Studies Branch, the Engineering & Research Branch, and industry have joined together to form a Deep Spills Task Force to develop and fund critical research needed to understand the fate of oil spills from deepwater blowouts. This year a modeling project was initiated, which will develop a three-dimensional model to simulate the dispersion and movement of oil and gas released from a deepwater blowout. Also, a complementary laboratory study was initiated, which will provide valuable information to the modeling effort.

FY 1998 Financial Summary

ESP Budget Increased! In response to the surge in GOM leasing activity and the bullish predictions of continued robust leasing, exploration, and development activity, MMS requested a supplemental budget increase from Congress for FY 1998. In response to that request, Congress authorized an increase in the Environmental Studies Program of \$4 million, specifically for deepwater studies. With the supplemental, the ESP budget has increased to a level not seen since 1993.

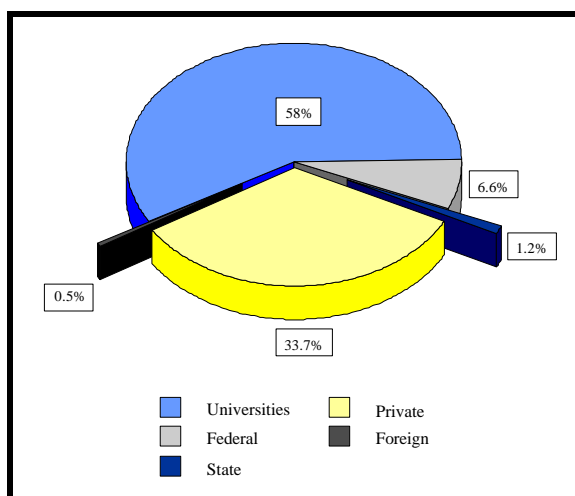
1998 Appropriation	\$14,460,000
Oil Pollution Act	1,177,000
Deepwater Supplemental	4,000,000
1997 Carryover	<u>913,000</u>
Total ESP Budget	\$20,461,000

Gulf Program Emphasized. In the 1990's, the regional ESP expenditures reflected an emphasis on studies in areas experiencing development activities—1998 was no exception.

While the Gulf program has dominated expenditures since 1991, the amount spent in 1998 has only now climbed back to the 1991-1992 levels, a direct result of the supplemental budget increase. Including CMI projects, the GOM initiated 31 new projects in FY 1998.

Universities Lead Research Recipients. Over the last several years, MMS has sought opportunities to create cooperative research programs with universities and others who could share the cost of doing the research. Universities typically conduct research through cooperative agreements or through contracts. As illustrated in the following figure and table 1 at the end of this report, 11 universities received 58 percent of the ESP budget in FY 1998.

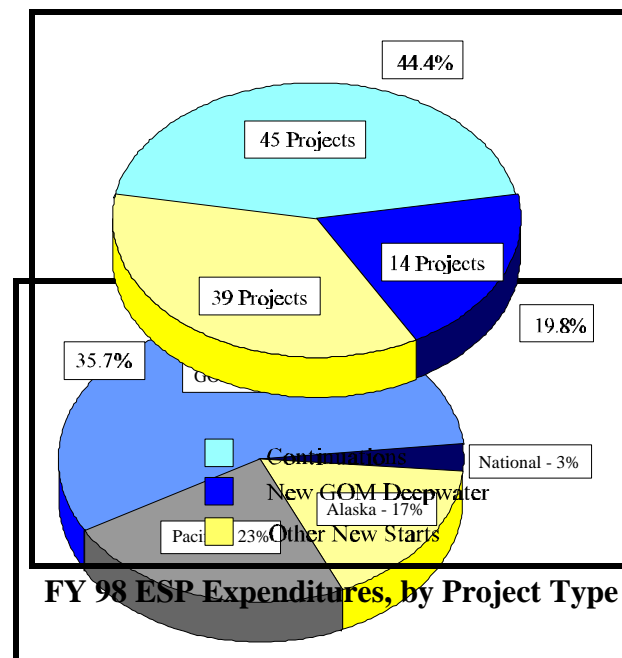
Also, several projects were carried out by Federal and State



FY 98 ESP Expenditures, by Recipient

entities. These funds are typically transferred via a memorandum of understanding or by an interagency agreement. Finally, a combination of the private and foreign sectors accounted for about 34 percent of the ESP expenditures this year, mostly via contract.

More Money for New Starts. With the lean budgets of past years, it had been necessary to “buy on credit” to start up programs that would require funding for several years.



FY 98 ESP Expenditures, by Project Type

FY 98 ESP Expenditures, by MMS Region

However, with the increased budget in FY 1998 and frugal planning, MMS could decrease the amount expended on the continuation of studies to less than 50 percent of the total budget.

In FY 1998, fifty-three new projects were started programwide (14 of which focused on GOM deepwater issues), and 45 continuing projects received funding. The titles and financial information for the key new starts are provided in table 2 at the end of this report.

Accelerated Procurement Plans. During FY 1998, the ESP staff and procurement staff marshaled efforts to get funds obligated at an earlier point in the fiscal year, relative to past years. By the end of July, 60 percent of the ESP budget had been obligated, a significant increase over the obligation level at that time in the previous fiscal year.

For further information on MMS and the Environmental Studies Program, visit the MMS Internet site at www.mms.gov. For specific information on the ESP, contact Mr. Larry Roberts, Chief, Branch of Environmental Studies, at Larry.Roberts@mms.gov.

Table 1. Recipients of ESP Funds in FY 1998	
Recipient	\$ Amount
Universities (cooperative agreements, contracts)	
Clarkson University	274,906
Florida State University	300,000
Louisiana State University	3,108,993
Scripps Institute of Oceanography	1,802,035
Texas A&M University	2,360,799
University of Alaska at Fairbanks	1,115,597
University of Arizona	374,981
University of California at Santa Barbara	1,961,513
University of New Orleans	100,000
University of South Florida	388,090
University of West Florida	57,802
subtotal	11,844,716
State Entities (cooperative agreements, contracts)	
Alaska Department of Fish & Game	179,808
NC Dept. of Environment and Natural Resources	62,350
subtotal	242,158
Federal (interagency and cooperative agreements)	
National Marine Fisheries Service	124,100
National Data Buoy Center	452,000
NOAA	5,000
NRC-OSB	25,000
Office of Naval Research	260,000
USGS BRD	236,400
In-house	254,973
subtotal	1,357,473
Private Sector (contracts, purchase orders)	
	6,988,308
Grand Total	20,432,655

Table 2. Key New Starts in FY 1998			
Study Title	Recipient	FY 1998 Obligation	Total Project Amount
Gulf of Mexico Coastal Marine Institute	Louisiana State Univ.	\$3,044,475	\$3,044,475
Long-term Monitoring at East and West Flower Garden Banks	Texas A&M Univ.	\$43,497	\$178,497
Breton National Wilderness Area: Inventories of Emissions of OCS Production and Development Activities in the GOM	Sonoma Technology, Inc.	\$353,053	\$353,053
Workshop to Develop Study Design for Circulation Regimes in NEGOM	Univ. of West Florida	\$37,297	\$37,297
North Carolina Workshop	Raleigh Plaza Hotel	\$9,118	\$9,118
Historical Social and Economic Impacts of OCS Activity on Families and Individuals	Univ. of Arizona	\$374,981	\$374,981
Assessing and Monitoring Industry Labor Needs	ICF Resources, Inc.	\$448,221	\$448,221
Fate of Deepwater Subsea Oil Spills: Modeling Oil and Gas Releases from Deep Water Blowouts	Clarkson Univ.	\$274,906	\$274,906
Literature Review to Determine the Environmental Risk of Chemical Products Used in Deepwater Oil & Gas Operations	Arthur D. Little	\$292,036	\$292,036
Fate and Effects of Synthetic Based Drilling Fluids and Associated Cuttings Discharged into the Marine Environment	Ayers & Assoc., Inc.	\$99,922	\$99,922
Benefits and Burdens of OCS Activities on Selected Communities and Local Public Institutions	Impact Assessment, Inc	\$640,590	\$640,590
Deepwater Physical Oceanography Reanalysis and Synthesis of Historical Data	Texas A&M Univ.	\$673,415	\$673,415
GOM Deepwater Information Resources: Data Search and Literature Synthesis	CSA	\$321,694	\$321,694
Research, Compilation, and Digitization of Problematical and Uncontrolled Source Maps for the Louisiana Statewide Oil and Gas Pipeline Digital Database	Snead, LSU, Louisiana Geological Survey	\$64,518	\$66,528
Prediction of Throughwater Shock Parameters from a Wellhead Explosive Charge	Multiple (WHOI)	\$10,333	\$10,333
Boating Uses, Economic Significance, and Information Inventory for North Carolina's Offshore Area, "The Point"	NC DENR	\$62,350	\$62,500
Gulf-Wide Information System Data Compilation and Quality Assurance/Quality Control	Research Planning Inc.	\$94,252	\$94,252
Enhancement of Submarine NR-1 GOM Science Cruise	Texas A&M Univ.	\$5,000	\$5,000
Marine Mammal and Sea Turtle Observations from NMFS Ichthyoplankton Cruises	NMFS	\$67,000	\$367,000
Analysis of Anomalous Oceanographic Conditions on the N.E. GOM Shelf	Univ. of West Florida	\$20,505	\$20,505
BWASP Power Analysis	SAIC	\$65,252	\$65,252
Alaska Coastal Marine Institute	Univ. of Alaska	\$1,115,597	\$1,115,597
Collection of Traditional Knowledge of the Alaskan North Slope	Ukpiagvik Inupiat Corp.	\$252,084	\$371,903
Reference Manual & GIS Overlays, Oil-Industry & Other Human Activity (1970-1995) in the Beaufort Sea	LGL, Canada	\$209,999	\$209,999
Mapping of Cook Inlet Tide Rips Using Local Knowledge	LGL, Canada	\$127,976	\$127,976
Update of Oil Industry Labor Factors for the Alaska Manpower Model	Jack Faucett Assoc.	\$131,503	\$131,503
SBC-SMB Circulation Study-Phase III: Seasonal Variability of the Circulation Between Point Conception and Point San Luis	Scripps	\$1,100,000	\$2,700,000
Survey of Invertebrate and Algal Communities on Oil & Gas Platforms in Southern California.	CSA	\$399,595	\$390,000
Pacific Region Information Transfer Meeting	MBC	\$160,000	\$160,000
Shorebirds of the Santa Maria Basin: Vulnerability to OCS-Related Activities and Accidents	Univ. of Cal. Santa Barbara	\$210,000	\$210,000
Effect of Airgun Noise on Marine Mammals: Response as a Function of Received Sound Level and Distance	USGS-BRD	\$25,000	\$25,000
Predictability of Ocean Models for Strategic and Long-term Monitoring on the OCS	ONR	\$250,000	\$550,000
YOTO Drifter Program	ONR	\$10,000	\$10,000
Chemical Response to Oil Spills: Ecological Effects Research Forum	Ecosystem Management	\$2,500	\$2,500